

WHAT IS CLAIMED IS:

1. An image forming apparatus comprising:

a printer which forms an image of a frame by forming an image for each line according to image data in the unit of pixel;

a sensor which detects a quantity of image distortion in the image generated by said printer during printing operation;

a first memory which stores a first component in a direction perpendicular to a line direction of the quantity of image distortion detected by said sensor for each pixel address in the line direction;

a second memory which stores a second component in the line direction of the quantity of image distortion detected by said sensor for each pixel address in the line direction; and

a corrector which corrects the image distortion by providing print data of a pixel at a position corrected in the line direction and in the direction perpendicular thereto according to the quantity of image distortion stored in said first and second memories.

2. The image forming apparatus according to claim 1, wherein said printer performs printing with a plurality of print colors and said sensor detects the quantity of image distortion of other colors than a reference color in the

print colors relative to the image of the reference color.

3. The image forming apparatus according to claim 2, wherein said printer comprises a plurality of image-forming units in correspondence to the plurality of print colors, and said image-forming units are arranged serially.

4. The image forming apparatus according to claim 1, wherein the first component of the quantity of image distortion stored in said first memory is represented by a first signal which represents a number of pixels in correspondence to the quantity of image distortion in the direction perpendicular to the line direction and a second signal which represents a position between adjacent pixels.

5. The image forming apparatus according to claim 4, wherein said corrector selects two adjacent lines according to the first signal and determines a weighted average of print data between the two lines selected according to the second signal.

6. The image forming apparatus according to claim 1, wherein the second component of the quantity of image distortion stored in said second memory is represented by a third signal which represents a number of pixels in correspondence to the quantity of image distortion in the line direction and a fourth signal which represents a position between adjacent pixels.

7. The image forming apparatus according to claim 6,

wherein said corrector selects two adjacent lines according to the third signal and determines a weighted average of print data between the two lines selected according to the fourth signal.

5 8. The image forming apparatus according to claim 1, further comprising an address counter which counts pixels in the line direction in synchronization to printing of said printer and determines read addresses of said first and second memories.

10 9. The image forming apparatus according to claim 8, wherein a count start address of said address counter can be changed.

15 10. The image forming apparatus according to claim 9, wherein the count start address can be changed according to a size of a paper on which the image is printed.

11. An image forming apparatus comprising:
 a printer which forms an image according to image data in the unit of each pixel;

20 a sensor which detects a quantity of image distortion in the image formed by said printer;

 a corrector which corrects the image by providing print data according to the quantity of image distortion detected by said sensor, wherein said corrector corrects the image distortion in a predetermined range; and

25 a controller which sets the quantity of image

distortion to a maximum in a predetermined range when the quantity of image distortion detected by said sensor exceeds the predetermined range and makes said corrector correct the image according to the corrected quantity of
5 image distortion.

12. The image forming apparatus according to claim 11, wherein said printer performs printing with a plurality of print colors and said sensor detects the quantity of image distortion of other colors than a reference color in the
10 print colors relative to the image of the reference color.

13. The image forming apparatus according to claim 12, wherein said printer comprises a plurality of image-forming units in correspondence to the plurality of print colors, and said image-forming units are arranged serially.

14. The image forming apparatus according to claim 11, wherein said corrector corrects the image distortion in a main scan direction and in a subscan direction.

15. An image forming apparatus comprising:
an encoder which converts input data of an image
20 to second image data having a smaller number of gradation levels than the input data;

a delay circuit which delays the second image data obtained by said encoder by a predetermined time;

a decoder which converts the second image data
25 delayed by said delay circuit to third image data having a

larger number of gradation levels than the delayed image data;

a corrector which corrects the third image data converted by said decoder according to image distortion;

5 and

a printer which performs printing according to image data corrected by said corrector.

16. The image forming apparatus according to claim 15, wherein said printer comprises a plurality of image-forming units in correspondence to the plurality of print colors, said image-forming units being arranged serially, and said delay circuit delays the image data in correspondence to a time lag of printing between said plurality of image-forming units.

15 17. The image forming apparatus according to claim 15, wherein said printer comprises a plurality of image-forming units in correspondence to the plurality of print colors, and said corrector corrects the image data to vanish position shifts of printed images formed by said plurality of image-forming units.

18. A method for forming an image of a frame by a printer by forming an image for each line according to image data comprising data in the unit of pixel, the method comprising the steps of:

25 detecting a quantity of image distortion in the

image generated by the printer during printing operation;

storing a first component in a direction perpendicular to a line direction of the detected quantity of image distortion for each pixel address in the line direction in a first memory;

storing a second component in the line direction of the quantity of image distortion detected by said sensor for each pixel address in the line direction in a second memory; and

correcting the image distortion by providing the print data of a pixel at a position corrected in the line direction and in the direction perpendicular to the line direction according to the quantity of image distortion stored in said first and second memories.

19. The method according to claim 18, wherein the printer performs printing with a plurality of print colors and the quantity of image distortion of other colors than a reference color in the print colors is detected relative to the image of the reference color in said detection step.

20. The method according to claim 18, wherein said printer comprises a plurality of image-forming units in correspondence to the plurality of print colors, and said image-forming units are arranged serially.

21. A method for forming an image by a printer according to image data in the unit of pixel, the method

comprising the steps of:

detecting a quantity of image distortion in the image generated by the printer during printing operation;

correcting the image by providing print data
5 according to the detected quantity of image distortion, wherein the image distortion can be corrected in a predetermined range; and

setting the quantity of image distortion to a maximum in a predetermined range in said correction step
10 when the quantity of image distortion detected in said detecting step exceeds the predetermined range.

22. The method according to claim 21, wherein the printer performs printing with a plurality of print colors, and the quantity of image distortion of other colors than a
15 reference color in the print colors is detected relative to the image of the reference color in said detection step.

23. A method for forming an image comprising the steps of:

encoding input data of an image to second image
20 data having a smaller number of gradation levels than the input image data;

delaying the second image data obtained in said encoding step by a predetermined time;

decoding the image data delayed in said delaying
25 step to third image data having a larger number of

gradation levels than the delayed image data;

correcting the third image data converted in said decoding step according to image distortion; and

performing printing according to image data
5 corrected in said correcting step.

24. The method according to claim 23, wherein a plurality of image-forming units in correspondence to the plurality of print colors are used in said printing step, said image-forming units being arranged serially, and
10 delaying the image data in said delaying step in correspondence to a time lag of printing between said plurality of image-forming units.

25. The method according to claim 23, wherein a plurality of image-forming units in correspondence to the
15 plurality of print colors are used in said printing step, and the image data are corrected in said correcting step to vanish position shifts of printed images formed by said plurality of image-forming units.